

FIG. 1A

DYNAMICALLY ADJUSTABLE  
DIGITAL GYRATOR HAVING  
EXTENDED FEEDBACK

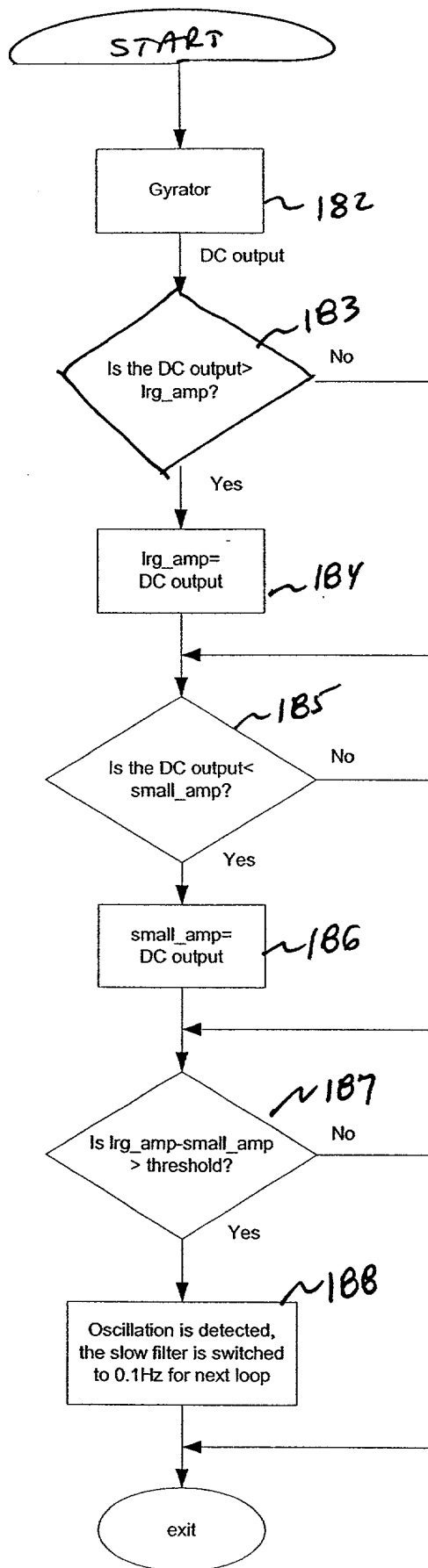
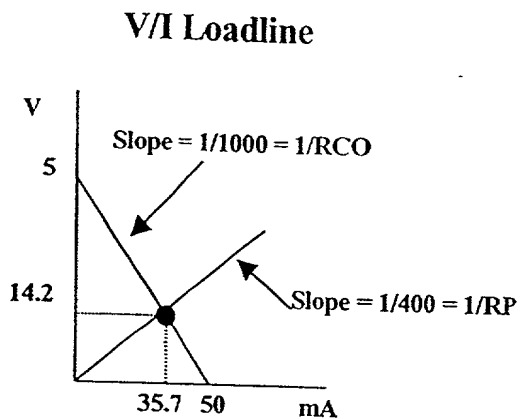
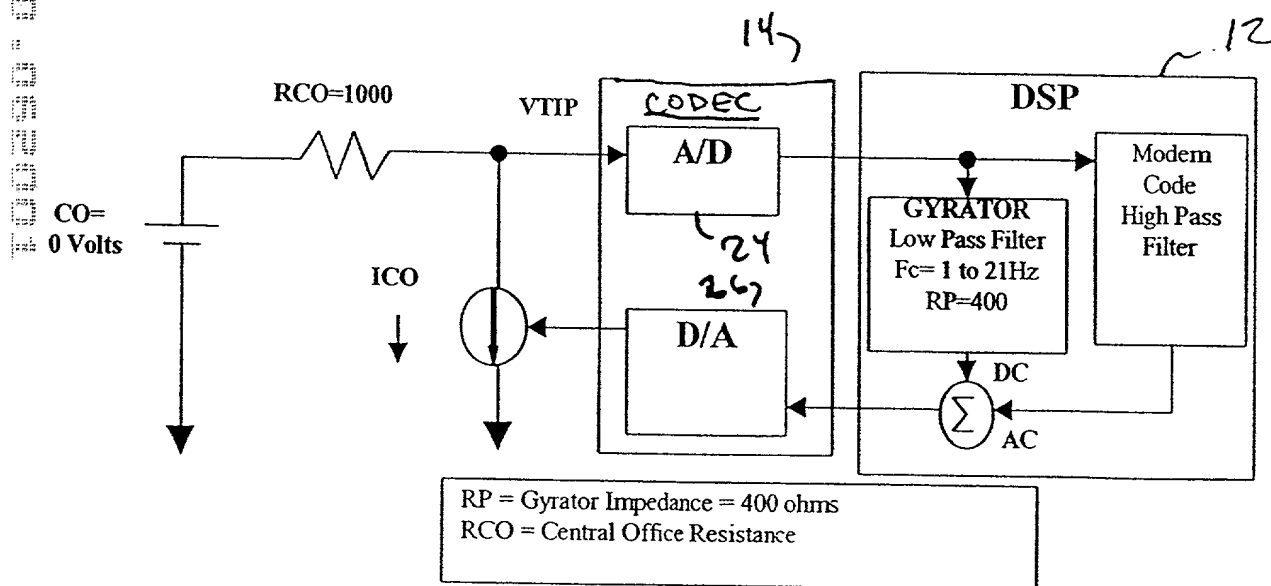


FIG. 1B



$50 - ICO \cdot RCO = ICO \cdot RP = VP$   
 $ICO = 14.27 \text{ mA}$   
 $VP = 35.7 \text{ Volts}$   
 Note: All results are at steady state

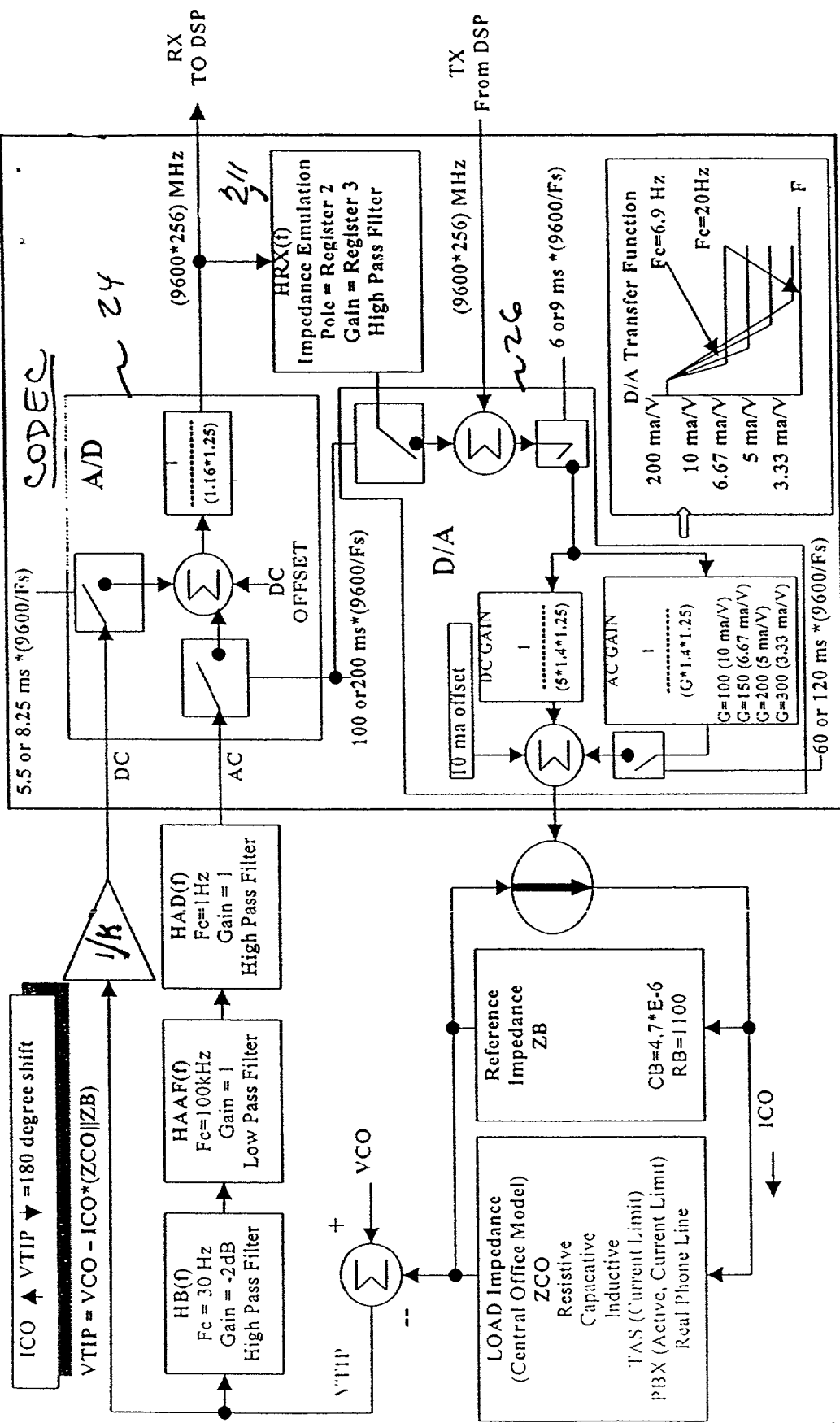
FIG. 2A



DYNAMICALLY  
 ADJUSTABLE  
 Digital Gyrator Example

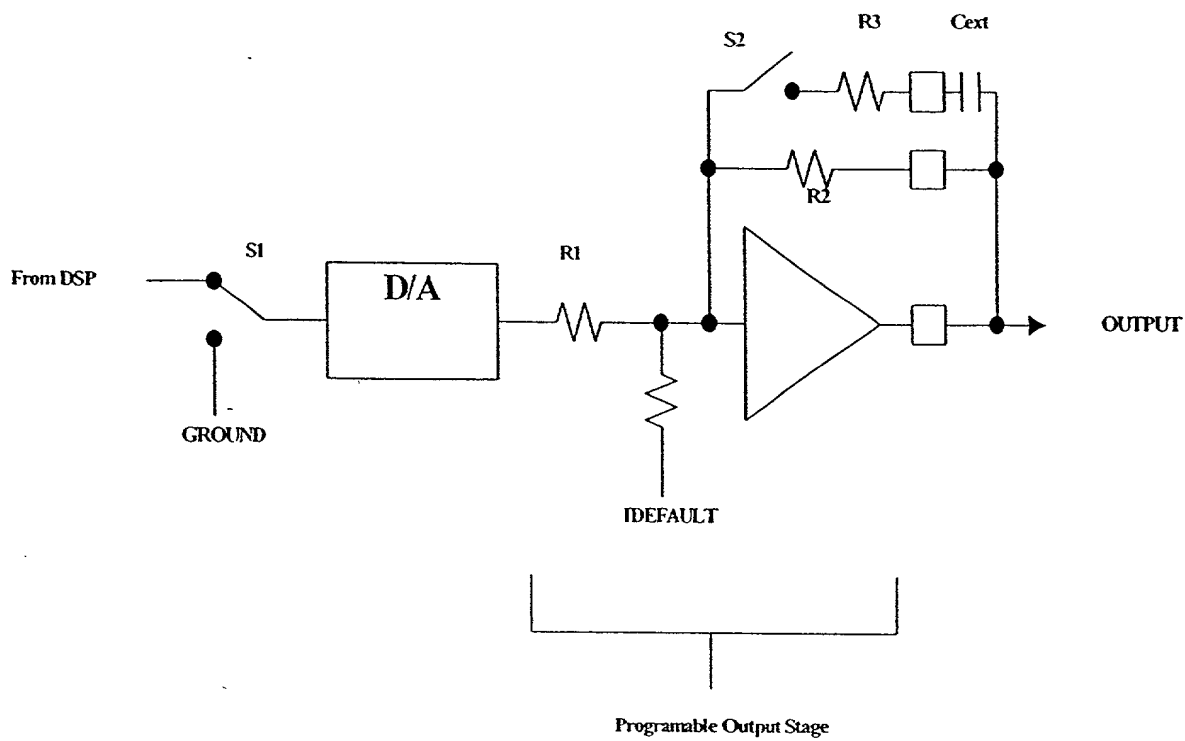
FIG. 2B

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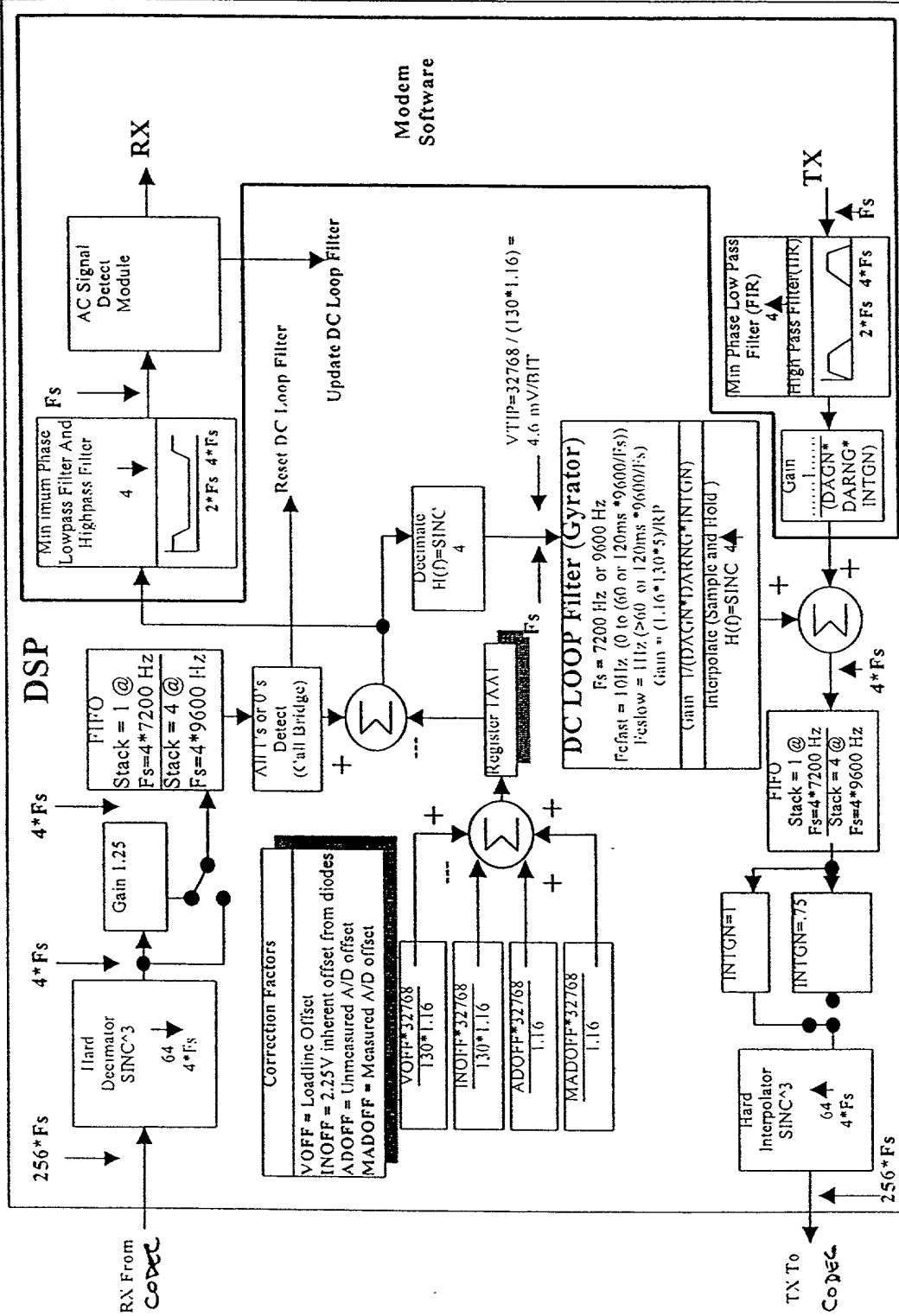
## CodeC and Telephone System Stability Block Diagram

Fig. 3



Simplified D/A Path

FIG. 4



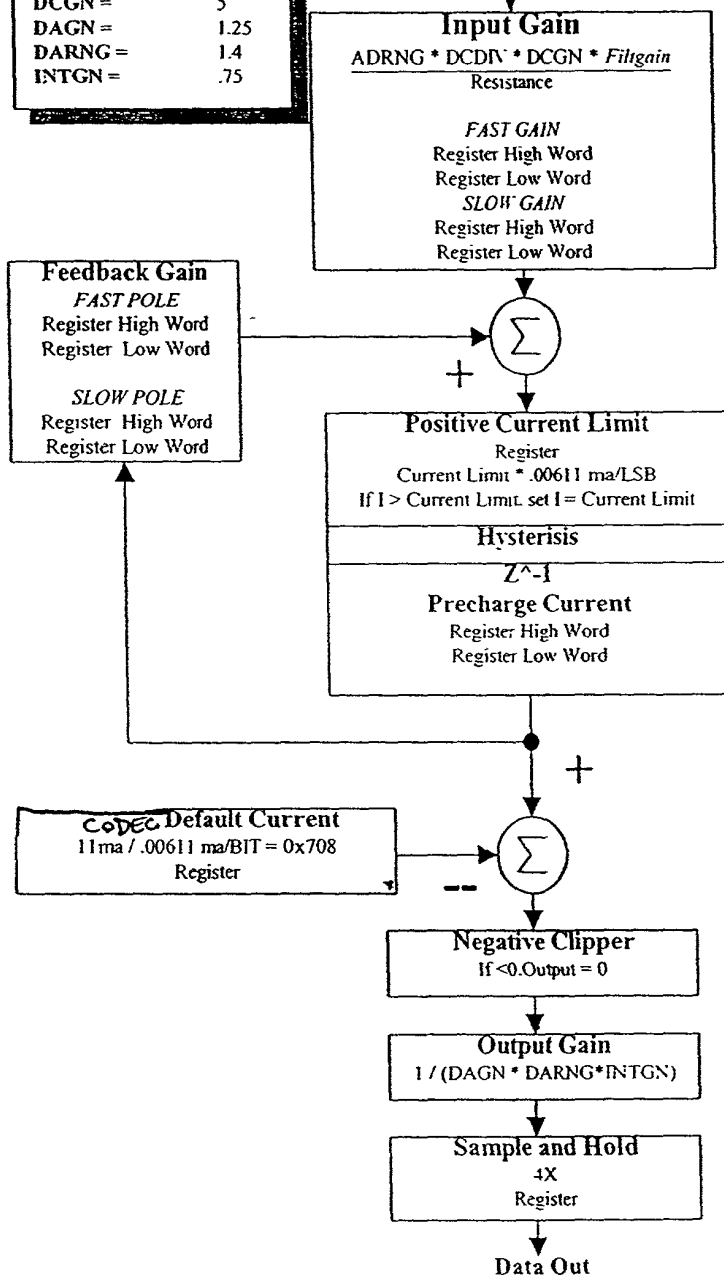
DSP Based Gyrator Block Diagram

FIG. 5

ADRNG =	1.16
DCDIV =	130
DCGN =	5
DAGN =	1.25
DARNG =	1.4
INTGN =	.75

Input @ 4.6mV/LSB @TIP

$$1 / (.005 * 32768) = .00611 \text{ mA/LSB}$$



$$H(z) = \frac{\text{Input Gain}}{1 - \text{POLE} * Z^{-1}}$$

FIG. 6

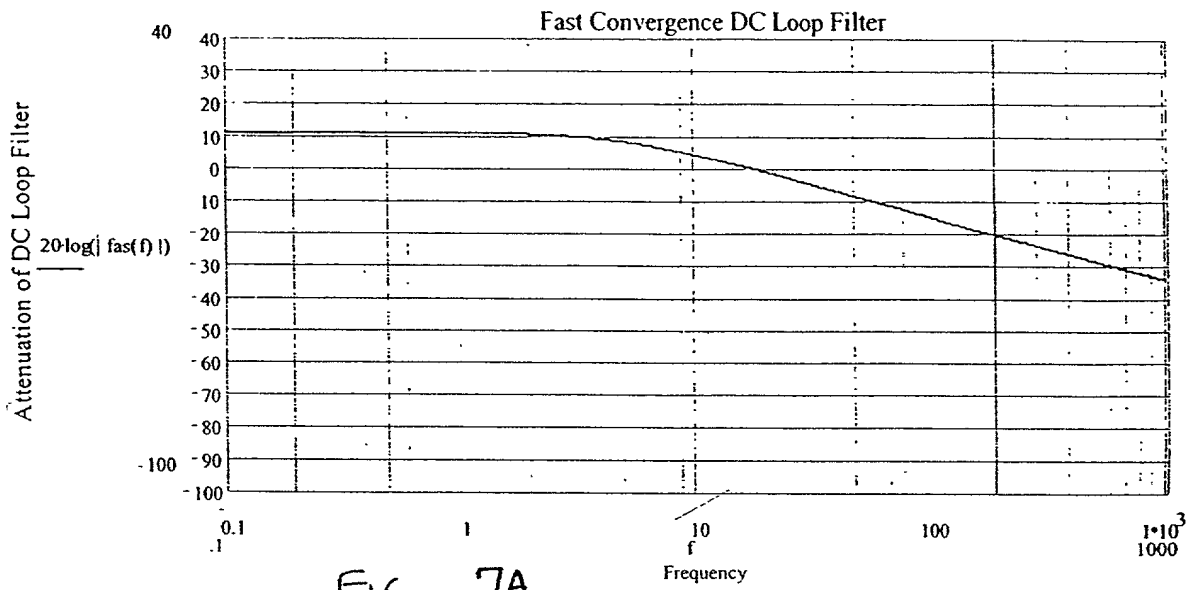


FIG. 7A

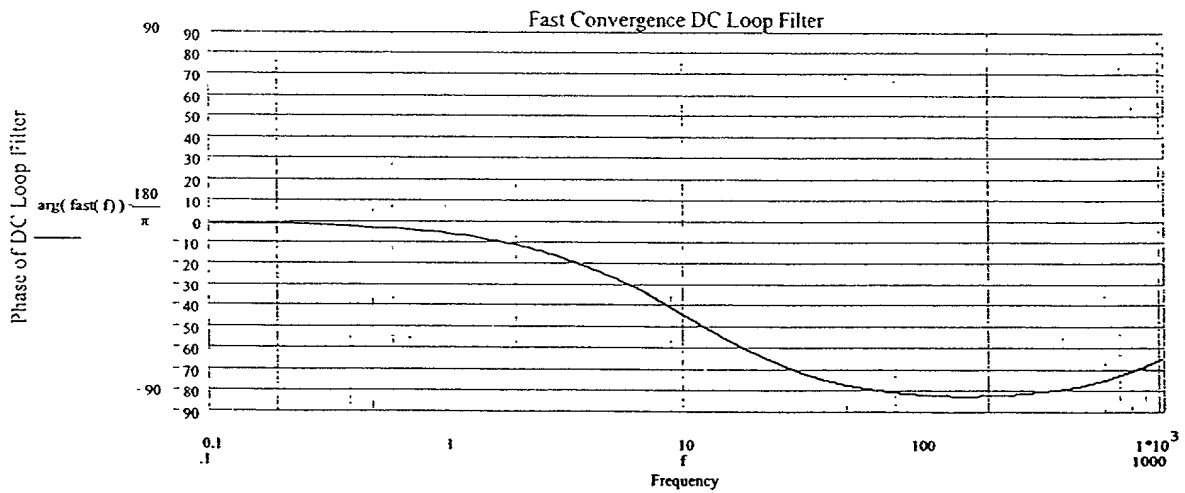


FIG. 7B

10 Hz Fast DC Loop Filter Gain and Phase



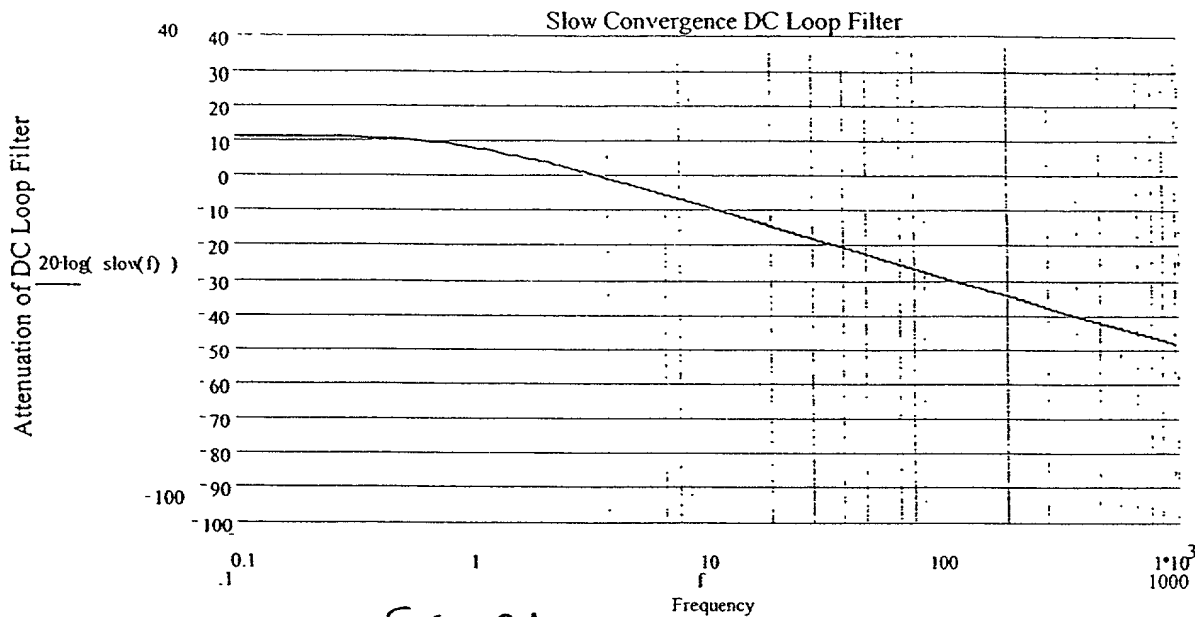


FIG. 8A

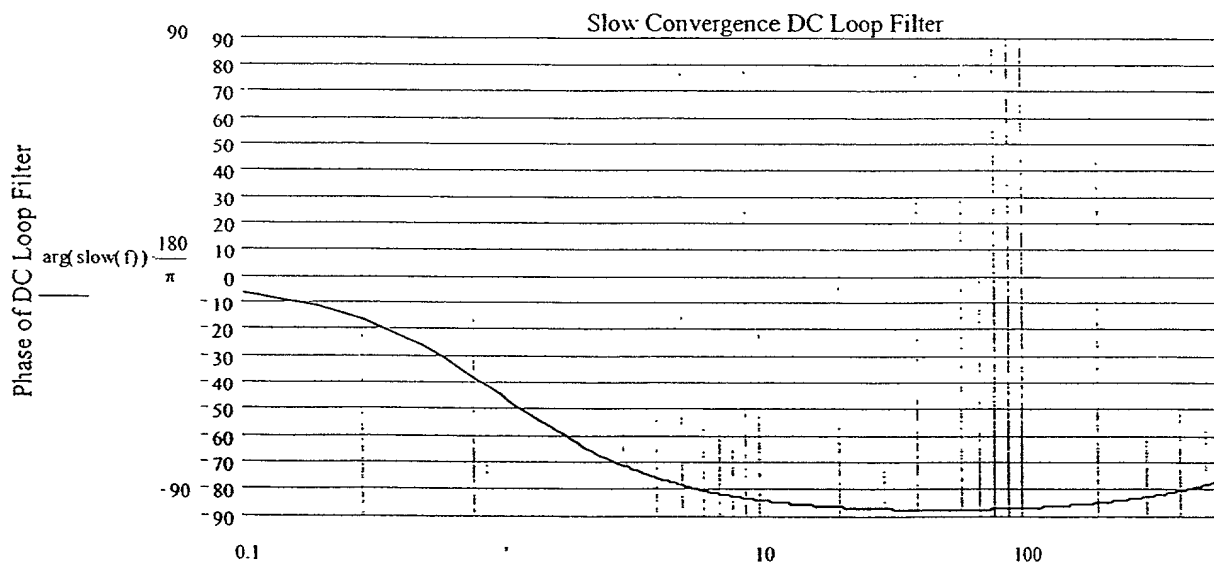
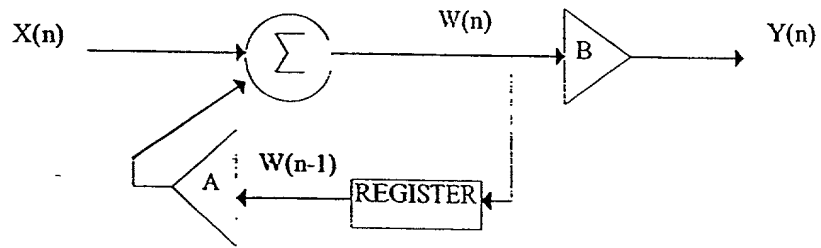


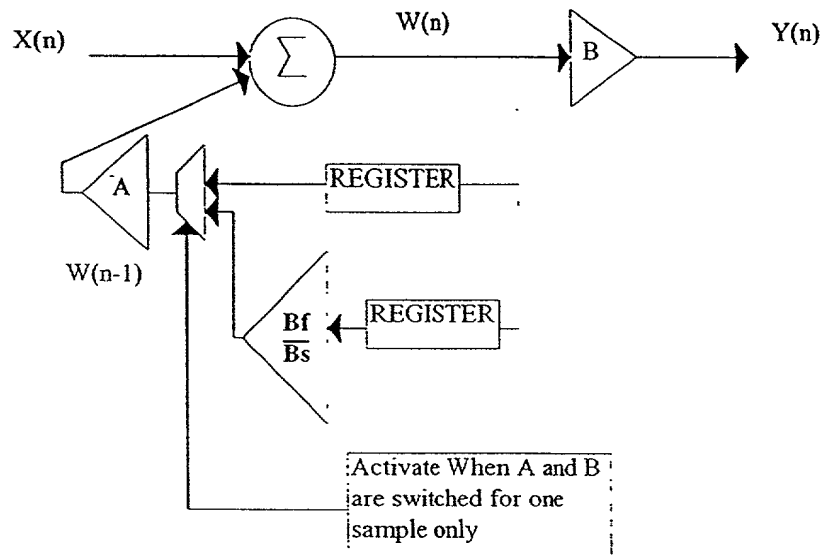
FIG. 8B

1 Hz Slow DC Loop Filter Gain and Phase



**First Order Filter Topology**

Fig. 9



Final Low Pass Topology with glitch removed

FIG. 10

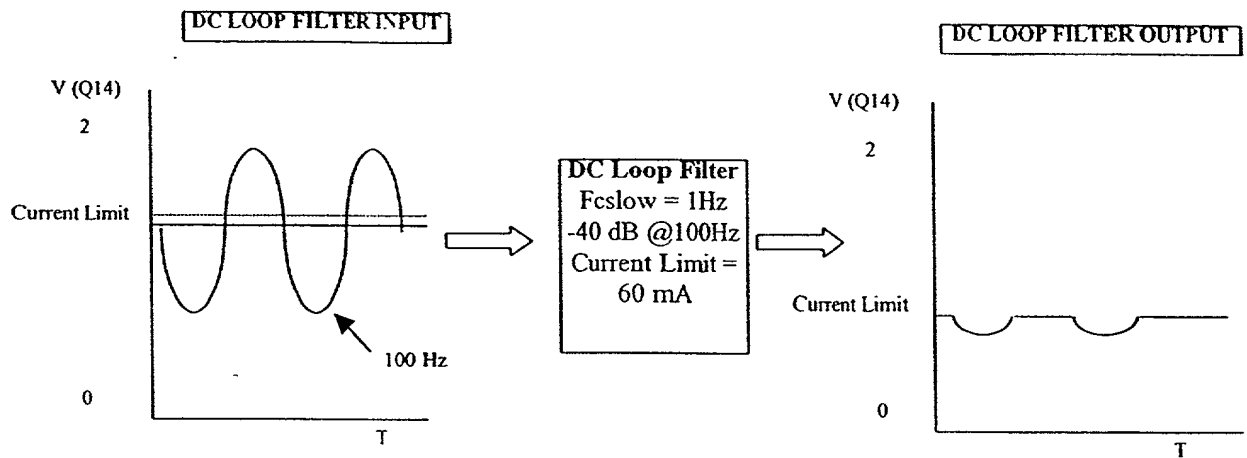


FIG. 11A

DC Loop Filter Without Hysteresis

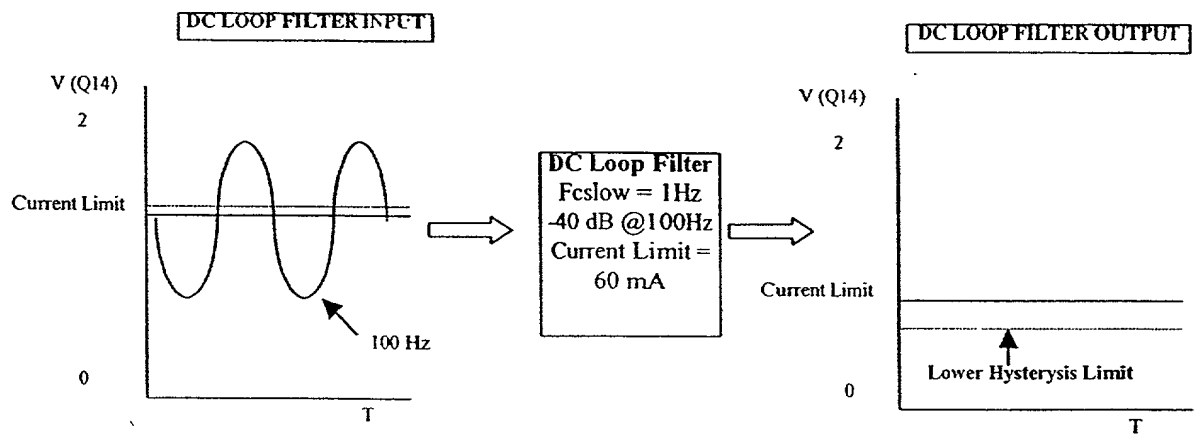


FIG. 11B

DC Loop Filter With Hysteresis

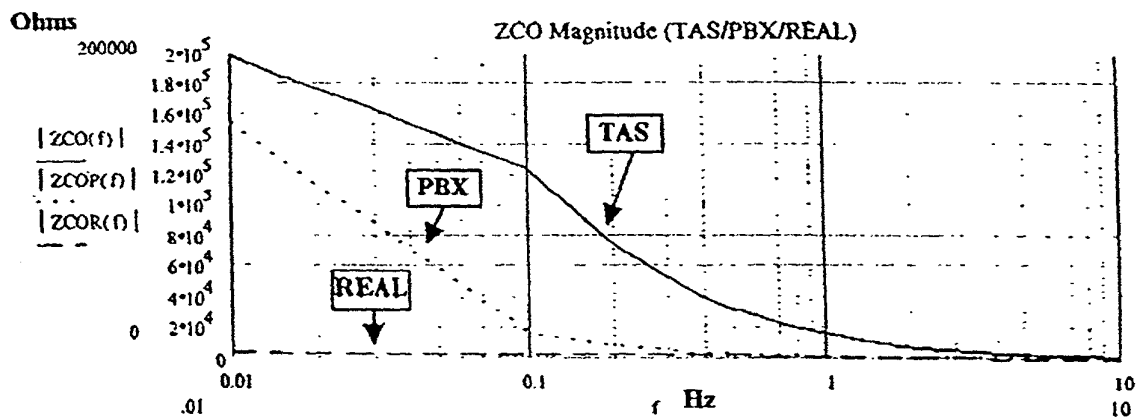


FIG. 12A

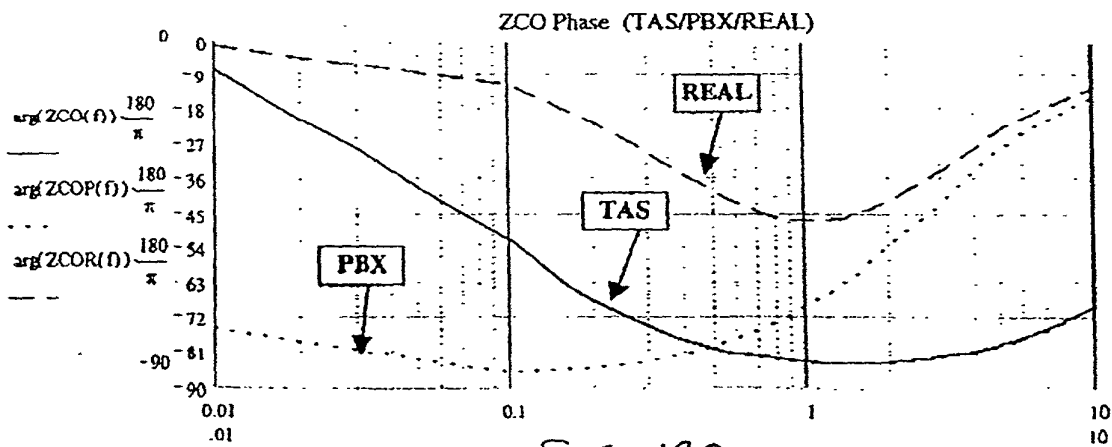


FIG. 12B

TAS, PBX and Real Phone Line V/I Loadlines

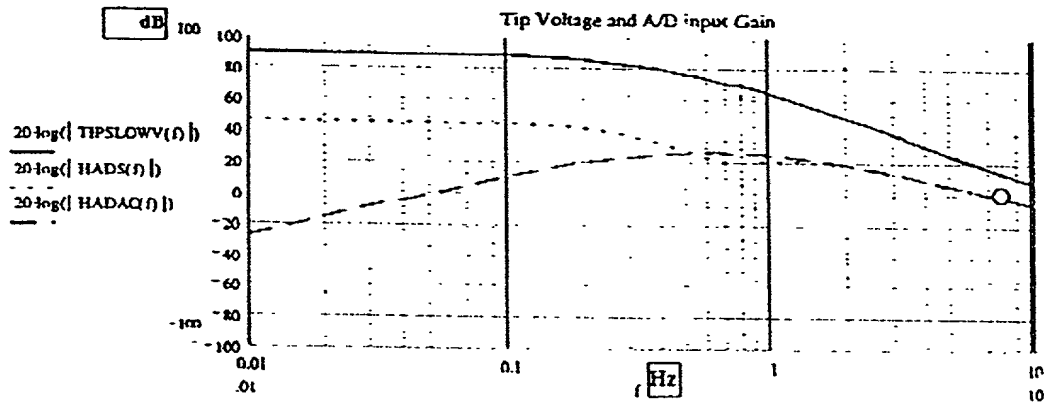


FIG. 13A

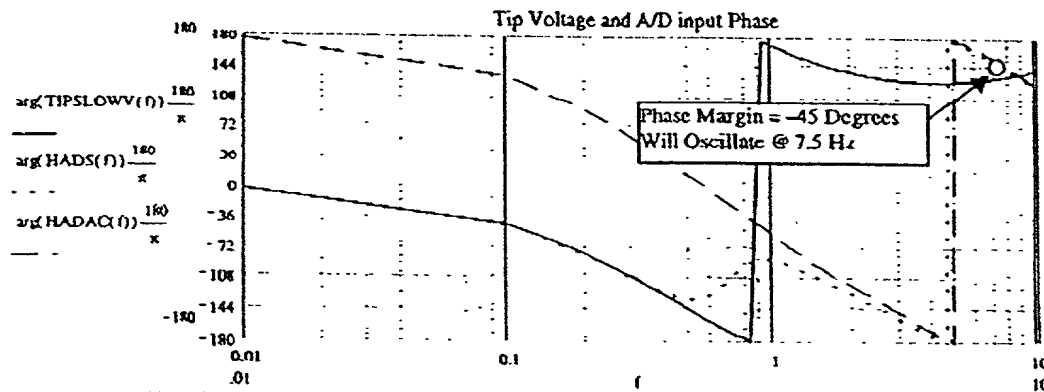


FIG. 13B

TAS Termination with Lowpass Filter Cutoff = 1 Hz

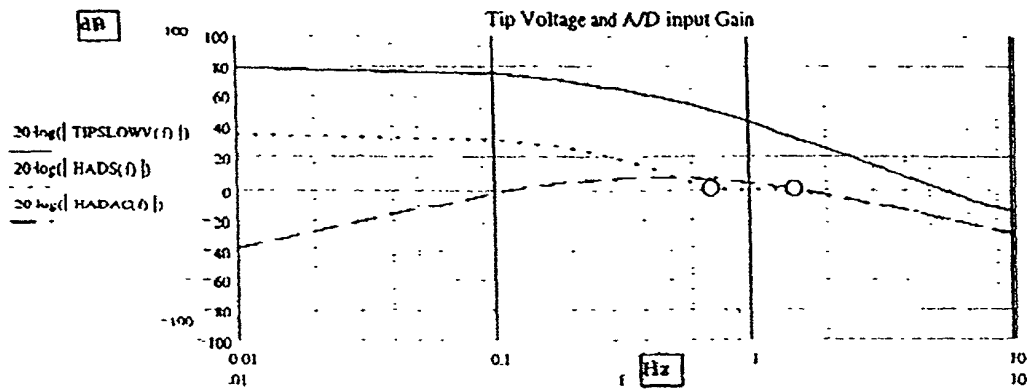


FIG. 14A

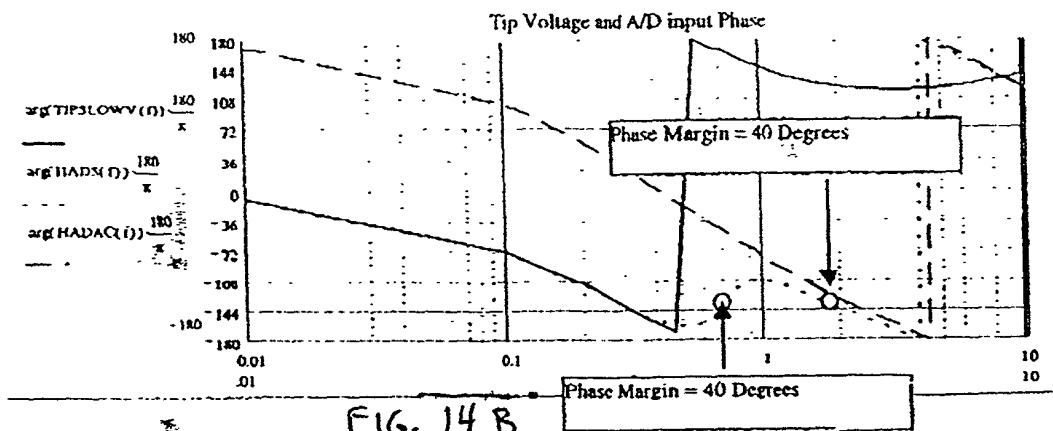


FIG. 14B

TAS Termination with Lowpass Filter Cutoff = .1 Hz

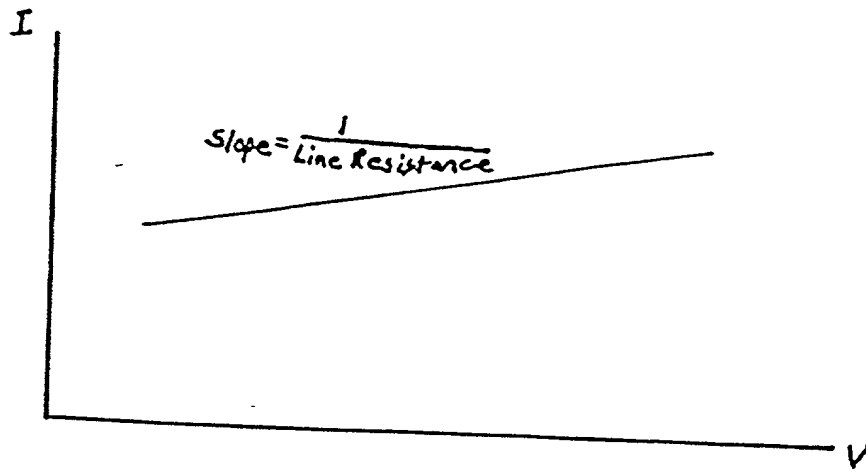


FIG. 15  
(PRIOR ART)

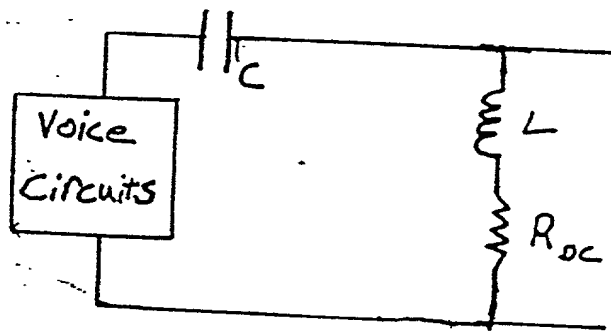


FIG. 16  
(PRIOR ART)

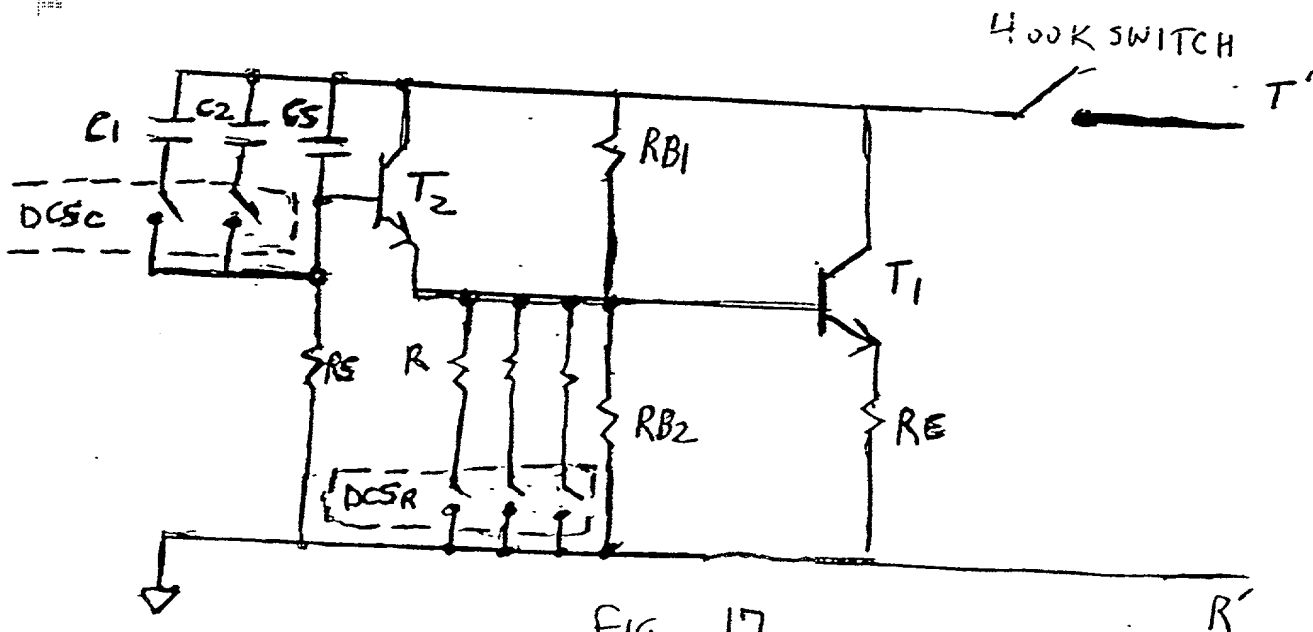
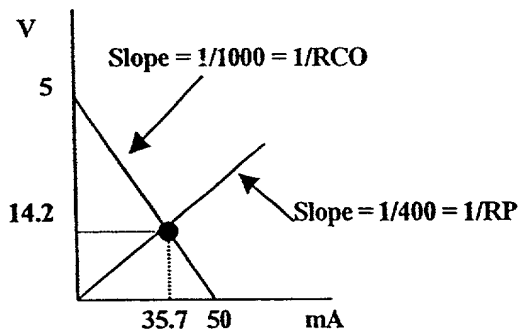


FIG. 17  
(PRIOR ART)



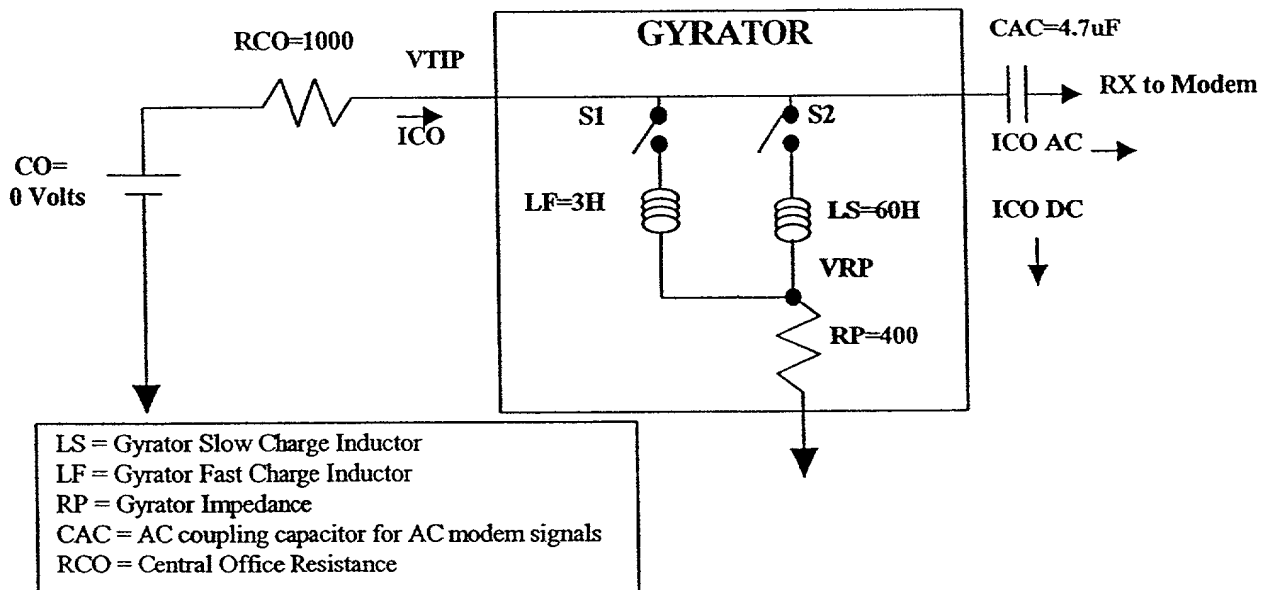
# V/I Loadline



$50 - ICO * RCO = ICO * RP = VTIP$   
 $ICO = 14.27 \text{ mA}$   
 $VP = 35.7 \text{ Volts}$   
 Note: All results are at steady state

PRIOR ART

FIG. 18A



Basic External Gyrator Example

FIG. 18B  
PRIOR ART